

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Priority Application of

Response Under 37 CFR 1.116 - Expedited Procedure  
Customer Number: 20277

Shigeki TOMISHIMA

Confirmation Number: 3797

Serial No.: 09 996,574

Group Art Unit: 2826

Filed: November 30, 2001

Examiner: V.A. Mandala Jr.

For: SEMICONDUCTOR MEMORY DEVICE

Box AF

Mail Stop AF

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is an Amendment in the above-identified application.

☒  
☐  
☐

No additional fee is required.

Applicant is entitled to small entity status under 37 CFR 1.27

Also attached:

The fee has been calculated as shown below:

	NO. OF CLAIMS	HIGHEST PREVIOUSLY PAID FOR	EXTRA CLAIMS	RATE	FEE
Total Claims	12	20	0	\$18.00 =	\$0.00
Independent Claims	1	3	0	\$84.00 =	\$0.00
Multiple claims newly presented					\$0.00
Fee for extension of time					\$0.00
					\$0.00
Total of Above Calculations					\$0.00

☐ Please charge my Deposit Account No. 500417 in the amount of \$0.00. An additional copy of this transmittal sheet is submitted herewith.

☒ The Commissioner is hereby authorized to charge payment of any fees associated with this communication or credit any overpayment, to Deposit Account No. 500417, including any filing fees under 37 CFR 1.16 for presentation of extra claims and any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

MCDERMOTT, WILL &amp; EMERY



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Date: August 21, 2003

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Docket No.: 57454-309

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of

Shigeki TOMISHIMA

Serial No.: 09-996,574

Filed: November 30, 2001

: **RESPONSE UNDER 37 CFR 1.116**  
: **EXPEDITED PROCEDURE**

: Customer Number: 20277

: Confirmation Number: 3797

: Group Art Unit: 2826

: Examiner: V.A. Mandala Jr.

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TECHNICAL STAFF 2300

For: SEMICONDUCTOR MEMORY DEVICE

**RESPONSE UNDER 37 CFR 1.116**

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The following Remarks are submitted in response to the Office Action dated June 20, 2003.

REMARKS

Claims 1 through 12 remain pending in this application. Claims 3 and 8 stand withdrawn. Claims 1, 4, 6, 7 and 9 through 12 stand rejected. Claims 2 and 5 stand under objection, but have been indicated to be allowable if presented in appropriate independent form. Favorable reconsideration of claims 1, 4, 6, 7 and 9, and allowance of the application are respectfully solicited.

Claims 1, 4, 6, 7, 9, 10 and 12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. patent 5,963,467 (Miyatake). Statement of the rejection is presented at paragraphs 2 - 7 of the Office Action. Claim 11 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyatake, as set forth in paragraph 8 of the Office Action. The Office Action finds all claimed features to be disclosed by Miyatake except for the requirement that the shunting interconnection lines are copper. Without specific reliance on prior art documentation, the Office Action concludes that provision of copper lines would have been obvious.

It is urged that claims 1, 4, 6, 7 and 9 through 12 are patentably distinguishable from Miyatake. Miyatake shows, see Fig. 9, the word line shunt line arranged in the first metal interconnection layer. The second metal interconnection line M2 is a Y select line as described on Col. 11, lines 6 to 8, contrary to the Examiner's hand written indication in the drawing that M2 represent subword lines. In Fig. 2 of Miyatake, the main word line is formed in the second metal layer. A sub word line select signal line FX is formed using the second metal line, which extends in a row direction, and a third metal line in the region that crosses the main word line. Miyatake also indicates in Fig. 3 that the main word line and Y select line are arranged crossing with each other.

Therefore, it is submitted that the arrangement shown in Fig. 9 could not be applied to the hierarchical arrangement of the main and sub word lines as shown in Figs. 2 and 3 of Miyatake. Particularly, Miyatake discloses on col. 10, line 41 et seq. that the memory cell structure shown in Fig. 9 is similar to the existing memory cell, except for the capacitor insulating film formed using a ferro-dielectric material, and that the word line is formed in the first polysilicon layer and the bit line is formed using the second polysilicon layer. Therefore, Miyatake does not intend that the arrangement shown in Fig. 9 is the hierarchical arrangement of main and sub word lines. It is submitted, therefore, that Miyatake does not anticipate the recitation of independent claim 1.

It is further submitted that claims 1, 4, 6, 7 and 9 through 12 would not have been obvious from the disclosure of Miyatake under established precedents relating to 35 U.S.C. § 103. While Miyatake indicates at col. 11, first paragraph, that the third metal interconnection layer may be used as needed, locating the main word line in the third metal layer would require an extreme hierarchical rearrangement that would not have been undertaken by a person of ordinary skill in the art. Even if such arrangement could be employed, the relation of the interconnection layers of the sub word line, the Y select line and the main word line would require substantial modification in order to avoid butting between the interconnection lines.

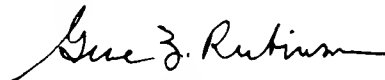
In summary, the first metal shunt line shown in Miyatake's Fig. 9 is not the word line shunt line in the memory cell structure in the hierarchical arrangement of main and sub word lines. Miyatake fails to teach or suggest the provision of the shunt line for the sub word line in the main/sub word line arrangement. The claimed invention provides

the sub word line shunting line using the interconnection line under the main word line interconnection layer, and thus is patentably distinguished from Miyatake.

Accordingly, allowance of the application is respectfully solicited. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in cursive script, reading "Gene Z. Robinson".

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**Date: August 21, 2003**